

INTERNATIONAL CENTER FOR ENVIRONMENTAL TECHNOLOGY TRANSFER

ICET

NEWSLETTER



For the future of the Earth



Purposes of Establishment

The International Center for Environmental Technology Transfer (ICETT) has been established through industry-public-academia cooperation for the purpose of transferring environmental technology possessed by Japan and other countries to other regions in order to alleviate environmental problems on a global scale.

By implementing various projects in different countries with consideration given to their characteristics and proceeding with smooth technology transfer, ICETT strives to achieve conservation of the global environment and sustainable development of the global economy.

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Tianjin Environmental Interaction Program

Overview

Yokkaichi City and Tianjin City, People's Republic of China, have interacted in a wide variety of fields since they concluded a friendship city agreement in 1980. As part of such interaction, we have been commissioned by Yokkaichi City since 1993 to organize training sessions to help Tianjin City alleviate its environmental problems. The events held in Yokkaichi City and Tianjin City have been attended so far by 136 people and 984 people, respectively. Featuring the theme "Improvement of Water Environment," the FY 2019 events consisted of a seminar in Tianjin City and a training session in Yokkaichi City.

Background and Purposes

While achieving a remarkable economic progress, Tianjin City is experiencing many environmental problems, requiring the city to alleviate them immediately. Accordingly, we implemented this program to help the city improve its environment by enabling officials of the city's Ecology and Environment Bureau to learn Japanese environmental technology and management methods.

Contents

1) Environmental Conservation Seminar in Tianjin City

We held a two-day seminar in Tianjin City on October 9 and 10, 2019, drawing 67 people, including officials from the city's Ecology and Environment Bureau and researchers. At the seminar, experts from Tianjin City explained the current situation of the city's water environment, while experts from Japan gave presentations on "Systems for Conserving Water Environment," "Restoration of Water Environment in Polluted, Closed Waters," and "Responsible-Care Activities at Plants in Coastal Areas." The final session on the second day featured a free discussion on improvement of water environment.



At the environmental conservation seminar

2) Training Session in Japan

The training session, held in Japan for 14 days from November 10 to 23, 2019, was attended by six people, including officials from the Ecology and Environment Bureau of Tianjin City. After learning from officials from Yokkaichi City about the city's present environmental efforts, the participants learned about the Japanese legal system and technology regarding prevention of water pollution. In addition, they visited companies and public agencies to learn not only about technology to conserve water quality but also about environmental education and corporate responsibilities.

The participants also visited a canal in Amagasaki to actually observe technology used for restoring an appropriate environment in closed waters, about which they had

learned at the seminar held in October. They also visited a company in Osaka Prefecture and the prefecture's Water Bureau and learned about water treatment technology and a project of combined use of water restored from sewage.



At the training session held in Japan

Results and Outlook

We have received the following comments from participants in the environmental conservation seminar in Tianjin City and participants in the training session in Japan:

(Environmental Conservation Seminar)

- The seminar has given us extensive insights useful for improving the water environment. The seminar is really helpful for my work.
- The seminar included not only an introduction to Japanese environmental policy but also an explanation of actual examples, enabling me to learn a lot. The seminar has made me aware of the sustainability of pollution prevention projects.
- We engaged in a discussion from various viewpoints from China and Japan, which enabled me to find out that the countries' environment improvement targets and measures conform to a significant extent.

(Training Session in Japan)

- The session, a combination of theory and practice, handled a rich lineup of topics and provided easy-to-understand explanations. I'm very satisfied.
- I was able to learn about treatment of polluted water and rainwater in all aspects, making me feel that my knowledge has been enhanced.

In 2018, the Chinese central government's former Bureau of Environmental Protection and the environmental organizations in other ministries were integrated and upgraded into the Ministry of Ecology and Environment. As indicated by this, China in general is now focusing on environmental improvement, increasing expectations for this program. We will continue to handle themes in line with Tianjin City's problems and strive to help the city improve its environment.

Japan-Asia Youth Exchange Program in Science (SAKURA Science Plan)

Overview

JST SAKURA Science Plan has intended to provide opportunities for young excellent people from countries and regions mainly in Asia to experience cutting-edge Japanese science and technology, thereby promoting interaction, such as joint research on a continuing basis, with excellent overseas talents who can contribute to innovation in the field of science and technology. As we did in FY 2018, we invited 10 high school students and two leaders (teachers) from the Republic of Palau (Palau) and organized an interaction program themed on environmental conservation in light of Palau's problem with waste management.

Background and Purposes

With growth in the number of tourist, Palau is now experiencing a continuous increase in the amount of waste. Meanwhile, waste incineration is not in place in the country. To use a newly established waste landfill site as long as possible, the country urgently needs to reduce the amount of waste. With the background of this waste management problem, we provided an opportunity for high school students from Palau to learn about cutting-edge Japanese science and technology with the theme of environmental conservation so that they could deepen their understanding about Japanese efforts regarding waste management.

Contents

1) Overview

Inviting a total of 10 students from the public Palau High School (PHS) and the private Belau Modekngai School (BMS), we held a seven-day program from September 4 to 10, 2019, so that they could deepen their understanding of waste management through Japanese science and technology. They attended lectures, a facility tour and a practicum to learn about a wide variety of aspects of Japanese science and technology, such as appropriate waste management methods employed by local governments and companies in Japan, recycling technology, and research and analysis methods used by universities and research institutes.

2) Relationship with Mie Prefecture

The high school students paid a courtesy visit to Mie Prefecture, with which Palau has a friendship agreement, and learned, for example, about the history of the interaction between Palau and Japan, typical waste processing method adopted in Japan, and Mie Prefecture's campaign of replacing plastic bags with reusable bags. Particularly because 2019 marked the 25th anniversary of the establishment of the diplomatic relationship between Japan and Palau, and because the father of the former Palau President was from Mie Prefecture, the high school students seemed to feel even closer to Mie Prefecture, making the atmosphere during the interaction with officials from the prefecture very friendly.

3) Interaction and Experience

At Mie University, the high school students learned about wind power generation through a strong-wind experiment using large-scale wind tunnel experiment equipment and group work under support from professors and university students. Afterwards, they visited the Mie Prefecture Health and Environment Research Institute, where they observed analysis equipment

and tried measuring the turbidity of tap water, hot spring water, etc. They also visited the Nagoya City Science Museum. At all these facilities, all the high school students observed various items very attentively with curiosity.

They also interacted with Japanese high school students and local residents in various ways. This year was the second time to interact with students of Mie Prefectural Kawagoe High School. They joined an English class and introduced their country Palau and high school life. They also enjoyed a traditional Palau dance together with members of the English club, making the interaction even more exciting. Moreover, they spent a holiday at homes of local volunteer members. They, thus, experienced a wide variety of aspects of Japanese culture.



At the Mie Prefecture Health and Environment Research Institute

Results and Outlook

It seems that this program has enabled the high school students from Palau to become aware of their country's current condition of waste management and ideal methods once again. After returning to Palau, the ten high school students gave presentations to an audience of about 100 students at a joint debriefing session organized by their two high schools. They spoke about what they had learned in Japan in terms of the environment, the excellence of Japanese technology, and the richness and beauty of Japan, sharing their lessons and experiences in Japan with many other students.

We have received appreciation from the principals of the two high schools, who commented that the program served as a very good interaction opportunity for the schools and that it was significant to join the program, designed to enable participants to learn about Japanese science and technology from a wide range of aspects, to foster high-level human resources.

We would like to take this opportunity to express our appreciation to the Japan Science and Technology Agency (JST), which enabled us to further consolidate our relationships with Palau and the two high schools, as well as our gratitude to Mie Prefecture, Yokkaichi City, and all the others in the prefecture who supported us.



After completing the program

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Recycling used food oil into soap (as part of the training session in Japan)

Results and Outlook

For this project, we have held resident meetings in cooperation with the BPW (C/P) to provide detailed explanations to local residents. We have been proceeding with the project while incorporating opinions from residents to the extent possible and forming consensus. After holding the training session in Japan, we organized a joint presentation event and invited residents from the two regions so that the training participants' information could be shared. Now that net baskets for collecting waste have been prepared and recycling stations have been constructed/installed, local residents are becoming increasingly aware of their commitment to waste reduction. The six types of waste that have never been recycled so far are now collected. The BPW keeps records of the weight of such waste each time and announces to residents how much waste is collected and recycled.

In Ibobang, where the project is going on ahead of Mongami, local residents talk with one another regarding how to use their recycling stations and problems occurring while they are in use, and they devise improvement measures each time.

In Mongami, it is expected that local residents may have some problems while they continue to use recycling stations. We hope, however, that the region's W/T will engage in discussions on a voluntary basis to continue their efforts and lead local residents to solve such problems. While continuing our local activities, we would like to find even better ways, help the waste separation and recycling efforts continue in Palau, and ensure that the initiative to reduce waste takes root in the country.



Collecting waste at a recycling station

Column

Palauans' Favorite Item "Betel nuts"



Also called "binrou," betel nut is a species of palm and a typical favorite item mainly in South-East Asia, like cigarettes and alcoholic beverages.

In Palau, both men and women prefer betel nuts to cigarettes. It is said that if you chew nuts of the tree together with slaked lime (powdered coral), you will feel uplifted. When this happens, the inside of your mouth becomes red, due to a chemical reaction. You need to spit out the remaining pieces after chewing and your saliva because it is bad for your health to swallow them down. While local residents use PET bottles or empty cans when spitting them out indoors, some often spit them out onto the streets.

Most people in Palau know that betel nuts are not good for their health, but they cannot stop the custom. Actually, children do not chew betel nuts, which they can enjoy after becoming adults.

The remaining pieces of betel nuts after being chewed contain a lot of saliva, and if you spit them out into PET bottles or empty cans, the containers can no longer be collected as recycling resources. Together with other types of waste, they are dumped into open dumps or landfill sites.

While respecting the custom of people in Palau, we would like to continue exploring ways to somehow handle and process such containers used for spitting the remaining pieces after chewing betel nuts, as part of our efforts for promoting the concept the "3Rs."

Project to Support for Local Innovation by Regional Core Companies (Support Project for Establishing New, Resource-Recycling-Oriented Business Models in the Chubu Region)

Overview

Solar panels are expected to be discarded in a large quantity in the future, and carbon fiber reinforced plastics (CFRP) is causing an issue regarding landfills. Striving to create businesses regarding recycling of these items in the Chubu region, we have implemented this project to consolidate our network in cooperation with private companies, testing and research institutes, etc. both inside and outside the region and to provide multi-angle support for local key companies with excellent recycling technology to establish new business models whether at home or abroad.

Background and Purposes

In June 2019, the Ministry of Economy, Trade and Industry released Outline of the Circular Economy Vision (Draft), which presents the direction to be taken by Japan and stipulates that it is necessary to recycle CFRP and solar panels as part of a recycling system to address new waste disposal issues arising in step with technological progress. In addition, in the Chubu region, major manufacturing industries such as automobiles and aircraft are concentrated, and there are many arterial industries, research and support organizations with advanced technological capabilities. Each business establishment works in close cooperation in line with the government's resource recycling policy, and this project is to support businesses working to build a resource recycling business model for solar panels and CFRP.

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1) Establishing a network for creating a new supply chain for recycling solar panels

It is expected that the generation of solar panel waste will hit its peak from 2035 to 2037, with an annual amount of such waste estimated to be 170,000 tons to 280,000 tons (1.7 to 2.7% of the industrial waste to be disposed of). Solar panels have a very robust structure containing glass and solar battery cells sealed together using ethylene-vinyl acetate (EVA) to enhance their long-term durability and weatherability. Accordingly, the separation and removal of such EVA is a big issue in recycling solar panels. Presently, it is often the case that used solar panels are disposed of at controlled final disposal sites with low disposal fees. In the future, it is expected that massive disposal of used solar panels will cause final disposal sites for industrial waste to become full, requiring effective use of such panels as resources.

With this background, we have conducted an interview survey with companies and organizations regarding the reuse and recycling of solar panels and identified issues to be addressed. We have also organized a seminar regarding the recycling of solar panels and meetings with parties concerned.

2) Expanding a network regarding the recycling of CFRP

Presently, most waste CFRP is disposed of at landfill sites. Striving to establish a society where such waste material can be used effectively, we have organized a seminar so that people in a wide variety of positions can learn about advanced efforts. In addition, we have held meetings for business operators to exchange opinions regarding issues of the formation of CFRP recycling businesses.

inar so that people in a wide variety of positions can learn about advanced efforts. In addition, we have held meetings for business operators to exchange opinions regarding issues of the formation of CFRP recycling businesses.

3) Conducting EU technology trend research and interviews with those concerned to prepare for Japan-Germany joint research to further develop CFRP recycling technology, and disseminating relevant information

To provide support for local key companies with excellent technology for recovering carbon fibers from CFRP to expand their operations both at home and abroad, we have conducted interviews with domestic intermediate-substrate manufacturers and other organizations regarding their recycling efforts, and we exchanged opinions with E.U. public research institutes and government officials.

4) Cooperating with a large company for open innovation

The Open Innovation Office of the Innovation Department, Osaka Gas Co., Ltd., has provided us with the latest information on various needs, based on which we have provided opportunities of match-making with SMEs with technology to address such needs.

Results and Outlook

Regarding the recycling of solar panels, we have ensured that new efforts are launched toward the use of glass recycled from panels by holding a seminar and meetings for exchanging opinions among parties concerned. For the recycling of CFRP, we have conducted interviews with companies to identify issues to be solved toward the formation of CFRP recycling businesses. At the same time, we have established a new network toward cooperative efforts by organizing a seminar for introducing advanced measures and meetings for exchanging opinions among business operators.

It is expected that the results and network generated by this project, including those by the match-making for open innovation, will facilitate the progress of various future activities.



At the solar panel recycling seminar

Survey of Business Opportunities for Overseas Expansion

Overview

For Yokkaichi City-based SMEs considering business development in Haiphong and its surrounding areas, we have conducted research to collect important information with which they can make decisions, such as information on local needs, the operating environment and support from administrative agencies, and compiled the research results into documents to be provided to companies.

Background and Purposes

In 2016, Yokkaichi City concluded memoranda with the Ministry of Planning and Investment of the Socialist Republic of Vietnam (Vietnam) and Haiphong City regarding interaction mainly through mutual cooperation and collaboration in the field of economy.

Based on the memoranda, Yokkaichi City has sent delegations, led by the mayor or the Chamber of Commerce and Industry, to Hanoi City and Haiphong City since 2016 in order to visit Japanese companies operating there and government agencies and to observe the cities' infrastructure. At the same time, delegations from Haiphong, including the vice director of the city's foreign affairs department, have also visited Yokkaichi City to speak at seminars for Yokkaichi City-based SMEs about Haiphong City and advantages to be enjoyed by Japanese companies considering operating businesses in the city. Both Yokkaichi City and Haiphong City have thus been engaged in efforts to invigorate economic interaction.

We have implemented this research project for collecting and disseminating important information so that Yokkaichi City-based SMEs considering business development in Haiphong and its surrounding areas can make decisions, such as information on local needs, the operating environment and support from administrative agencies.

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From July 29 to August 3, 2019, we conducted local research to identify needs and collect information from organizations operating in a wide variety of fields. This was feasibility research designed to help Yokkaichi City-based SMEs develop new businesses in Haiphong or make new investment in the existing businesses already developed in Vietnam by such companies. Before conducting the research, we had conducted online research and document retrieval and also participated in seminars for companies making inroads into Vietnam.

In Vietnam, we interviewed the local government agency Haiphong People's Committee to learn about the city's current condition and preferential treatment for foreign companies and other support measures. Afterwards, we interviewed the operator of an industrial complex located in the city and Japanese companies operating in the complex regarding advantages granted to foreign companies starting their operations in the complex, the background of their expanding their businesses to Haiphong, and their operating situations. In addition, we also interviewed the Japan International Cooperation Agency (JICA) Vietnam Office, the Japan External Trade Organization (JETRO) Hanoi Office and other support agencies regarding Vietnam's trends in various fields, such as economy and investment environment.

We also made confirmation not only about advantages and points to note for companies trying to make inroads into Haiphong City, but also about expected achievements by companies operating in the manufacturing, service, environmental conservation, logistics, and education industries as entities working in fields where they can contribute to solving local problems through technical support.

We have compiled these research results into documents so that Yokkaichi City-based SMEs can refer to them when considering developing businesses in Haiphong, Vietnam.

Results and Outlook

This project has enabled us to check the economic development situation of Haiphong City and support measures provided by local administrative agencies, such as preferential treatment, as well as the situations of Japanese companies already launching their businesses there. Accordingly, we have identified the feasibility of Yokkaichi based-companies' making inroads into the city.

The interviews conducted as part of our local research have revealed that Japanese products are highly recognized for their high quality, indicating that the reliability of Japanese products is high among local residents.

In Haiphong City, an AEON Mall is currently being constructed and is scheduled to open in the summer of 2020. It might be a good option to take this opening as an opportunity to promote the high quality of Japanese products and attractive points of merchandise from Yokkaichi City.

We hope that Yokkaichi City and Haiphong City will further consolidate their ties and proceed with economic interaction, thereby facilitating Yokkaichi City-based SMEs to develop their businesses in Haiphong City and its surrounding areas.



Visit to Haiphong People's Committee



Haiphong with its development in progress

Providing Support for Plastic-Recycling Companies to Operate Abroad

Overview

We are striving to ensure that agreements are concluded in the framework of JICA's support project for SMEs to engage in SDGs businesses as part of our efforts to promote the recycling of plastic resources by helping companies with excellent environmental conservation technology to develop their businesses in Pacific island countries. In FY 2019, we organized a seminar and workshop in Nagoya City and conducted preliminary research in Fiji.

Background and Purposes

Based on the Japanese government's Plastic Resource Recycling Strategy (as of May 31, 2019), we would like to contribute to solving problems related to the global environment and waste through transfer of environmental technology.

In particular, small island countries in Oceania have problems with processing waste, including waste plastic, because of their small areas and isolated, remote, and oceanic locations. To solve the problems, much expectation is placed on corporate technology by JICA, which has been engaged for years in a local technology cooperation project regarding waste management.

Contents

1) Seminar and workshop

On February 4, 2020, we held a seminar and workshop in Nagoya City for considering potentials of environment businesses in Pacific island countries.

Pacific island countries are blessed with a rich line-up of sightseeing resources, while they are susceptible to the impact from a population increase and global warming, meaning that consideration for environmental conservation should be given in the countries. At the event, we provided the participants with information on the potentials of environmental businesses, waste-related businesses in particular. The event also included a Q&A session and opportunities for participants to exchange opinions.



At the seminar and workshop (Nagoya Innovator's Garage)

2) Preliminary Research in Fiji

We conducted preliminary research for 14 days from February 22 to March 6, 2020 in the Republic of Fiji (Viti Levu Island) mainly for the following three purposes:

1. Identifying the current situation and problems of waste (plastic waste in particular);

2. Collecting information to ascertain the feasibility of Japanese companies with plastic waste processing technology to develop their businesses; and
3. Participating in a public-private joint economic mission organized by the international organization Pacific Islands Centre (PIC), and exchanging information

In Fiji, we met members from nearly 30 waste-related organizations and groups, such as the Ministry of Waterways and Environment, JICA's Fiji Office and JICA's Japanese Technical Cooperation Project for Promotion of Regional Initiative on Solid Waste Management in Pacific Island Countries (J-PRISM), as well as officials from local governments and staff from the hotel and sightseeing industry, the manufacturing industry, recycling companies, universities, etc. While gathering local information, we introduced Japanese companies' technology of processing waste plastic.



Recycling station in Lautoka City (introduced as part of JICA J-PRISM project)

Results and Outlook

At the seminar and workshop, we provided the participants with basic information on the current situations of Pacific island countries, while establishing a network with companies and organizations interested in Pacific island countries.

Local preliminary research has enabled us to confirm that there are high demand for waste management and an urgent need for its improvement in Fiji. In addition, our research has found that very favorable, high expectations are placed on Japanese companies' waste processing technology by the Fiji government, local governments, companies, etc.

Based on the findings of the preliminary research, we will organize a second workshop for interested companies. We will continue to carry out various efforts, including visiting Fiji once again, to ensure that agreements are concluded in the framework of JICA's support project for SMEs to engage in SDGs businesses.



Providing Support for Financial Arrangements for Clean Energy Projects

Overview

To support developing countries' measures against climate change and clean energy businesses, we have been supporting the Private Financing Advisory Network (PFAN), designed to help business developers raise funds. In FY 2019, as part of the initiative, we organized a business development workshop and investment forum in Asia and an investment forum in West Africa, commissioned by the Renewable Energy and Energy Efficiency Partnership (REEEP).

Background and Purposes

It is indicated that behind the failure to realize clean energy businesses, there are often barriers, such as a shortage of business developers' capabilities to prepare business plans necessary for fund-raising and to give presentations on their business plans and a shortage of match-making opportunities for business developers and investors.

To remove these barriers, the PFAN project has been implemented to provide business developers with advice and instructions for preparing proposal documents and to organize investment forums as match-making opportunities for business developers and investors to support their fund-raising, thereby striving to contribute to the realization of clean energy businesses in developing countries.

Contents

1) Business development workshop and investment forum in Asia (Asia Forum for Climate and Clean Energy Financing: AFCCEF-9)

① Business development workshop

Date: April 23 – 25, 2019
Venue: Bangkok, Thailand (Arnoma Grand Bangkok Hotel)
Participants: 57 in total (business developers, experts, etc.)

Placed as a workshop to prepare for an investment forum (AFCCEF-9), this event was held for 20 business developers whose projects had passed the first round (application screening) of the selection process. At the workshop, the business developers received instructions from experts and investors regarding business plans and presentations to investors.



Business developers, experts and PFAN staff

② Investment forum (AFCCEF-9)

Date: November 1, 2019
Venue: Singapore (Marina Bay Sands, Sands Expo and Convention Centre)
Participants: 138 in total (investors, business developers, experts, judges, etc.)

At this event, 10 business developers who had passed the second round of the screening process after the business development workshop gave presentations on their business plans to investors and those from financial institutes, hoping that their presentations would serve as a threshold of obtaining

funding. To draw many more influential investors, the investment forum was held as part of the Asia Clean Energy Summit (ACES), organized by the Sustainable Energy Association of Singapore (SEAS).

We held the forum as a competition. As a result of screening, the awards went to the following business developers, some of which have already reached financing agreements with investors.



At the investment forum

○ Winner

- Manufacture and sales of biomass fuel mainly in Cambodia

○ Runners-up (two business developers)

- Sharing system of electric bicycles in Vietnam
- Irrigation management system for medium- and small-scale farmers in India, etc.

2) Investment forum in West Africa (West Africa Forum for Climate and Clean Energy Financing: WAFCEE-4)

Date: September 26, 2019
Venue: Abidjan, Côte d'Ivoire (African Development Bank)
Participants: 77 in total (business developers, experts, etc.)

We held the forum as a competition, where eight business developers who had passed the paper screening process gave presentations on their business plans to investors to ask for financing.



At the forum venue
(Africa Development Bank)

In accordance with the results of the screening, the awards went to the business developers below. Even after the event, the PFAN is continuing to provide support for business developers to obtain funding.



At the award ceremony

○ Winner

- Solar power generation business in Nigeria

○ Runners-up (three business developers)

- Solar power business in Togo
- Power generation using waste in Ghana
- LED lighting and solar power business in Ghana

High School Students' Global Environment School

Overview

Commissioned by Yokkaichi City, we held the Global Environment School for high school students. In FY 2019, the event lasted eight days from July 29 to August 5, with the theme "Toward a Recycling-based Society – Consider the Global Environment from the Perspective of Waste Problems"

Background and Purposes

Every summer vacation season, we invite high school students from Yokkaichi City's friendship city Tianjin, China, and Yokkaichi City's sister city Long Beach, the U.S., so that they can receive a training program, exchange opinions with high school students of Yokkaichi City regarding environmental problems, and deepen mutual understanding. By doing so, we strive to ensure that young people who will play the major role in the next generation consider the environment from a global viewpoint and invigorate environmental conservation movements in all three cities. FY 2019 marked the 12th anniversary of the program.

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Running about one week, this program included visits to a wide variety of facilities and companies, including the following:

- Yokkaichi Pollution and Environmental Museum for Future Awareness
- Yokkaichi City Clean Center
- Mitsubishi Chemical Corporation Mie Plant
- Kabuse-cha Cafe
- Yokkaichi Festival
- Miyako Ecology Center (Kyoto City)



Courtesy visit to the Mayor of Yokkaichi and the Director of the Yokkaichi City Assembly

In addition to the above, the participants also attended a lecture from Professor Satoshi Chiba from the Faculty of Environmental and Information Sciences, Yokkaichi University, to learn about the ocean plastic problem, which is drawing much attention today, and engaged in fieldwork on the Yoshizaki coast, Yokkaichi. The actual observation of ocean plastic waste on the coast made them keenly realize that it is a problem affecting everyone around the world.

To spread the effect of this program not only among the program participants but also among high school students of Yokkaichi City who did not participate in the program, we held an event to interact with students from high schools in Yokkaichi City. The event consisted of environmental interaction programs prepared by students from three high schools in Yokkaichi City (Yokkaichi High School,

Yokkaichi Nishi High School, and Kaisei High School). The event enabled the high school students to learn about environmental problems from one another and adopt a wide variety of perspectives.

Another purpose of the Global Environment School is to promote global interaction through culture. Accordingly, the program incorporated an experience of Japanese flower arrangement in cooperation with the flower arrangement club of Yokkaichi Commercial High School. While experiencing an aspect of traditional Japanese culture, the program participants enjoyed interaction with high school students.



Fieldwork on the Yoshizaki Coast

At a presentation session, the program participants gave presentations on the results of their one-week training program. Divided into two mixed teams consisting of students from the three cities, they presented what they would do in the three cities to address the global waste problem. Afterwards, Associate Professor Atsuko Hanashima, the Faculty of Design Technology of Osaka Sangyo University, commented on the presentations and delivered her lecture "Waste Problems are Still at the Root of Environmental Problems" allowing the high school students and citizen audience to understand more about waste problems.

Results and Outlook

Various contents of the program enabled the high school students not only to obtain knowledge on waste problems but also to present specific environmental conservation efforts that they would make in their respective cities to accomplish their targets. They thus showed significant growth.

We hope that the friendships forged through this year's High School Students' Global Environment School will lead to continuous interaction among the high school students, who will play the main roles in the future in their respective cities. We look forward to seeing them serving as individuals who will contribute to improving environmental problems in Tianjin, Long Beach, and Yokkaichi in the near future and as bridges of friendship among the three cities.

Environmental Seminars

Overview

We organize our facility tours and environmental seminars for schools and other organizations to introduce our activities and also to raise public awareness of environmental conservation.

FY 2019

Tour participants: Komono UNESCO Association, Collaborative Research Organization for Future Regional Society (Mie Satellite) of the University of Tokyo, Institute for Global Environmental Strategies (Kitakyushu Urban Center), etc.

Environmental Seminar: Yokkaichi University

We also participated in an environmental event organized by Yokkaichi City.

In FY 2019, a total of 17 persons visited us, while a total of 51 persons joined our seminar.

We will continue our activities to tell people of various generations, from elementary school students to university students and adults, about the importance of environmental conservation.



Column

Delegation to Vanuatu

The Republic of Vanuatu consists of 83 islands in the South Pacific Ocean in an area stretching about 1,200 km from north to south. I was sent to this country for eight days from February 22 to 29, 2020, as a member of a research unit to promote understanding under a JICA overseas cooperation project. I would like to introduce what I learned about the country's waste measures and favorite drink while I was there.

1. Waste Measures

The national government of Vanuatu is actively proceeding with plastic reduction measures. Since July 2018, regulations have been enforced to ban the distribution of plastic bags, straws, and trays for food items at supermarkets. Since December 2019, it has been prohibited to use seven types of plastic items, such as forks and spoons.

On the other hand, waste to be transferred to final landfill sites is not separated properly, preventing resources to be recycled.

With this background, Vanuatu is trying to introduce compost bins, which decompose kitchen garbage through microorganisms and produce compost, and expand the use of them. Moreover, the country is also trying to introduce a container deposit system*.

* In this system, if you purchase an item contained in a bin or PET bottle, you pay a "deposit" to cover the cost for the bin or PET bottle at the time of purchase. If you later bring the container to a designated place, you will be reimbursed fully or partially for the deposit.



Final waste landfill site

2. Kava

The word "kava" might remind many Japanese people of the word "kaba," meaning hippopotamus in Japanese, but it is a drink in Vanuatu. For this drink, a slight amount of water is added to juice squeezed from the ground roots of a *Piper methysticum* tree.

If you drink the brown liquid, which looks like muddy water, your tongue and throat will sting, but it is said that kava has a sedation effect. Actually, people in Vanuatu love this drink.



Kava

There are kava bars on the streets, and I hear that the tastes of the product differ depending on the bar. The price of kava depends on its volume, although the lowest price of a cup of kava is equivalent to about 50 yen.

I sipped kava only slightly, but it took about a week for my stomach to return to its normal condition. Kava is drunk also in Fiji, Tonga and some other countries in Oceania. If you have an opportunity to visit any of these countries and have strong digestion, why not try the drink?

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